

The constancy of wave-velocity requires that h and t should vary inversely as g . The law of conservation of areas demands the same ratios of variability in the rotation of any contracting or expanding nebular nucleus; for, the velocity of rotation varying inversely as radius, and the distance traversed varying as radius, the time of rotation (or t , the time of semi-rotation) varies as the square of radius; but g varies inversely as the square of radius, $\therefore gt \propto \frac{1}{r^2} \times r^2$, and is constant for all possible stages of nebular condensation. The record of rotation is, therefore, invariable, representing the undulatory velocity of the æthereal medium, as well as the constant limiting velocity of gravitating tendency for which Faraday sought.

The value of g being a maximum, in our system, at Sun's surface, there is where the limiting value of gt is to be found. If we estimate Sun's semi diameter* at $16' 2''$, Earth's mean radius vector is 214.41 solar radii. Laugier's mean estimate of t (the time of Sun's semi-rotation) is 12.67 days, or 1093872 seconds; $\therefore \bar{g}r = (214.41^{\frac{3}{2}} \times 2\pi r) \div (365.256 \times 86400) - \therefore g = r \div 2559500$. and $gt = r \div 2.340$. But the velocity of light, according to Struve's constant of aberration, is $214.41 r \div 497.825 = r \div 2.322$.† This investigation, therefore, leads to the same result as those which I have before undertaken, and gives *the velocity of light* as the limiting constant of gravitation.

Stated Meeting, November 1, 1878.

Present, 20 members.

Vice-President, MR. FRALEY, in the Chair.

Mr. J. B. Knight, Prof. L. Haupt, and Dr. Morris Longstreth, newly elected members, were introduced to the presiding officer and took their seats.

Letters accepting membership were received from Dr. Albert H. Smith, dated 1419 Walnut St., Phila., Oct. 20, 1878; Rev. Edward A. Foggo, D. D., 717 Locust St., Phila., Oct. 28, 1878; Rev. Samuel Longfellow, Germantown, Oct. 24; and Dr. A. S. Packard, Jr., Brown University, Providence, R. I., Oct. 18, 1878.

Letters of acknowledgment were received from the Observatory at Prag, Nov. 6, 1877 (99, 100, List); the Royal Danish Academy, Sept. 30, 1878 (100, List); the Royal

* Amer. Nautical Almanac.

† This is equivalent to Faye's value of gt for lat. $16^{\circ} 59'$, or Carrington's for lat. $14^{\circ} 46'$.

Institution, London, Oct. 15, (101, Cat. III); the Royal Astronomical Society, Oct. 18, (101, Cat. III); the Society of Antiquaries, London, Oct. 14, (101, Cat. III); and the Boston Public Library, Oct. 17, (Cat. I, II, III).

Letters of envoy were received from Sir Lewis Mallet, India Office, Oct. 11, 1878; Physical Society of Bordeaux, Oct. 15 (acknowledging also the receipt of Proc. 95, 96, 98, 99); Meteorological Office, London, Oct., 1878; and Mr. E. Steiger, 25 Park Place, New York, Oct. 23, 1878.

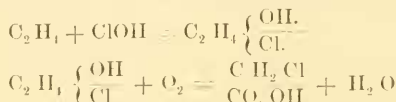
Donations for the Library were received from the Academies at St. Petersburg, Copenhagen, and Brussels; the Société Vaudoise; Geographical Society, School of Mines, and Revue Politique, Paris; Commercial Geographical Society at Bordeaux; Observatory at San Fernando; Harvard College Library, and Museum of Comparative Zoology, Cambridge; E. Steiger; Entomological Society of Brooklyn; Engineers Club, and Historical Society, Phila.; Museum of Wesleyan University, Middletown, Conn.; Public School Library, St. Louis; and the Argentine Society of Sciences at Buenos Ayres.

Prof. Chase read a "Note on the density of the Kinetic Ether."

Prof. Sadtler read a paper "On the Electrolytic Estimation of Cadmium, by Edgar F. Smith, Ph.D." as a contribution from the Laboratory of the University of Pennsylvania.

Prof. Sadtler presented to the Society a chemical preparation obtained by a new and interesting reaction from Pennsylvania petroleum.

The presence of *Olefines* or unsaturated hydrocarbons in Petroleum has been proved by Prof. Schorlemmer, who obtained bromides of these hydrocarbons by the action of bromine upon the several fractions of petroleum. This reaction has only proved the presence of the lower boiling members of the series however. I had given to me by Dr. C. M. Cresson a thick viscid liquid said to be mainly made up of higher olefines. Now the following reactions have been carried out with Ethene C_2H_4 —



I endeavored to apply these reactions to the mixture of higher olefines

and succeeded perfectly. In oxydising I used the "chromic acid" mixture, and after obtaining the chlorine-substitution acids I saponified them with caustic soda. The preparation shown is, therefore, a mixture of soda salts of these chlorine-substitution compounds of the higher fatty acids. As these compounds cannot be made by such reaction from the higher "paraffins," their formation proves conclusively the presence of the higher "olefines."

Prof. Houston read a joint paper entitled "On the circumstances influencing the efficiency of Dynamo-electric machines, by Prof. Houston and Prof. Thompson.

Prof. Haupt read a paper entitled "On the scales of Maps" with tables.

Pending nomination No. 871 was read.

Prof. Houston's resolutions, offered October 4, were called up for consideration, and after a discussion of the subject by Prof. Barker, Prof. Houston, Prof. Thompson, Dr. König, and other members present, it was

Resolved, That the fourth and fifth paragraphs of page 728 of No. 101 of the Proceedings, being portions of the minutes of the meeting of June 21st, 1878, be corrected to read as follows :

"Prof. Houston exhibited a microphone relay invented and made by himself and Prof. Thompson of the Philadelphia High School, to be applied to the articulating telephone."

"Prof. Barker exhibited a suite of Mr. Edison's instruments invented and made by him during the last year or two, and stated that, in his opinion, in their inventions so far as they involve similarity of principle, Mr. Edison had priority over Mr. Hughes."

It was then, on motion of Dr. LeConte, resolved that the Index on page 730 be corrected accordingly.

Prof. Sadtler referred to the reading of a letter from Prof. Morton to the Secretaries, at the last meeting, and said that he had already himself made due acknowledgment to Prof. Morton before the Society at the meeting of August 16th, 1878, as the minutes show.

And the meeting was adjourned.